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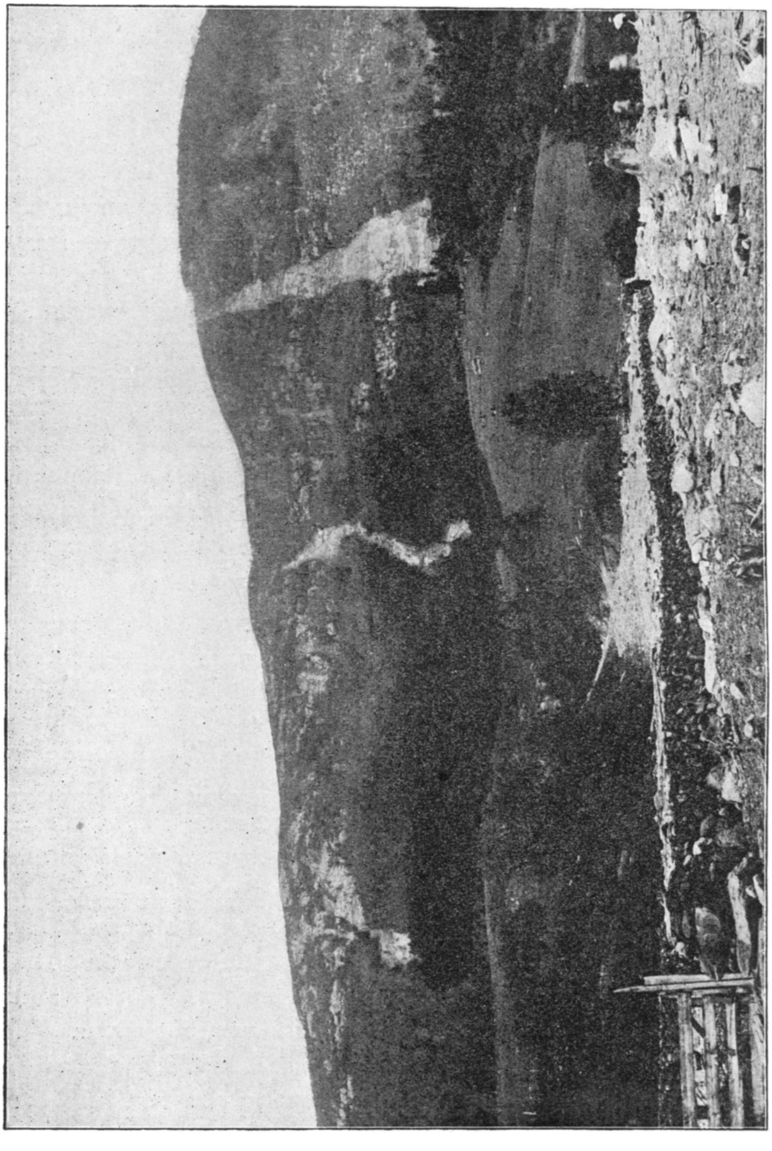
THE LANDSLIDES OF MT. GREYLOCK AND BRIGGSVILLE, MASS.

A STUDY of the topographic and geologic maps of Mt. Greylock will show where, theoretically, landslides would be most likely to occur. Both the large and small slides on this mountain are where, in theory, they should be. These slides are typical of one class, and the one at Briggsville of another.

The scarring of the mountain side by this agency is a very striking feature of the landscape, as one looks west from the Hoosac range and from the Hoosic valley for two or three miles on either side of Adams. The eastern side of Greylock is the steepest on the mountain, rising 1400 feet in two-fifths of a mile. It was on this slope, the base of which is about two miles west of Adams, that the land slipped. In all there are three large and eight small landslides within a mile.

The facts concerning the conditions at the time at which the landslides occurred were gathered largely from persons in the vicinity of Adams, but especially from Mr. C. O. Gould, whose farm is located at the foot of the main slide. The facts are as follows: During July and August, previous to August 20, 1901, the date on which the slides occurred, 12.92 inches of rain fell, being 5.8 inches above normal. At about three o'clock on the afternoon of the 20th a very heavy rain, spoken of usually as a cloudburst, began to fall, and lasted until seven o'clock. The record for this period at Williamstown (on the other side of the mountain) is 2 inches; at Mt. Tom, 3.42 inches. The water in the creek at the foot of the mountain rose very rapidly until it was as high as it had ever been noticed. When the slide occurred the stream became "a torrent 75 to 100 feet wide, 10 feet deep, and filled with trees." Five or six acres of the farm were covered with sand and bowlders, some of the bowlders being 4 feet in diameter.



Mt. Greylock, showing landslides. (The steepness is not well shown.)

The middle slide came first, and the large one to the north next. The time of the occurrence of the large slide to the south was not noticed, but all must have occurred within a few minutes of each other.

The mountain in this place is made up, above, of a mica schist (Greylock schist), and, below, of a rotten micaceous limestone (Bellowspipe limestone). The slope is covered with loose talus and earth, upon which is a sparse growth of trees.

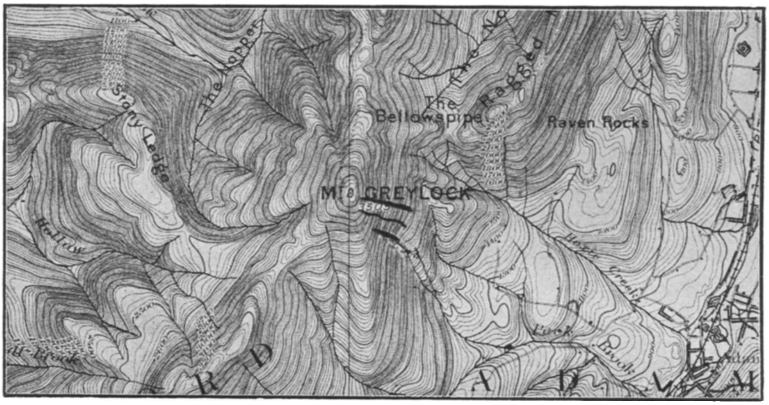
The north landslide occurred at the road near the top of the mountain, where the slide is about 50 feet wide, and extends for 1500 feet down the mountain side. It gradually widens until at the base it is about 200 feet wide.

From the above it will be seen that all of the conditions were favorable for a landslide; the steepness of the slope, the fissile character of the rock, the loose material of the mountain-side wet with the unusually heavy summer rain. All that was needed to cause a slipping of this loose material was a large quantity of water to add to the weight of the mass, and at the same time act as a lubricant. The destructive force of the water was caused by the natural drainage of an unusually heavy rain, and by the water brought down and squeezed out of the mass which slid down the mountain-side. There is no evidence that a dam was formed. In the ravine through which the water flowed the water was in places 25 feet deep, as shown by the overflow.

The removed material was not piled up with a backward slope toward the mountain, as is usually the case, the great quantity of water being sufficient to remove a large part of the débris so that much of the rock and earth was carried to and deposited in the valley below.

The landslide at Briggsville is more complex. Back of the woolen mills of Strong, Hewatt & Co., and on the west bank of Beaver Creek, one sees stratified blue clay tilted at all angles from a 90-degree to an almost horizontal position. A pier is raised 4 feet and tilted to the west, and the dam to the north of the mill is raised several feet on the west side. The tilted area is about 325 feet long and 33 feet wide. To the west of this is an excavation from which the material in the creek bed was derived. This cavity is some 320 feet in length from east to west, and about 30 feet lower than the original surface.

The history of the phenomena is as follows: During 1895 a spring, called a "geyser" in this vicinity, broke out with considerable force. The water contained a great deal of sediment, (finely divided blue clay) which was at first "as thick as pea soup" and contained large quantities of decayed roots. The muddy water was of sufficient volume to so contaminate the water of Beaver Creek as to render it unfit for the use of the Windsor Print Works.



Topographic map of Greylock with position of the three large landslides.

The land above the spring gradually sank as the bank was undermined and with each subsidence of the surface the spring moved back toward the high bank to the west. Before the sinking occurred growing trees sank beneath the surface, in an upright position, and poles could be driven down several feet with little effort. During a flood in March, 1901, the bridge pier was tilted, the dam was raised, and the clay appeared in the creek bed. This land continued to rise for several months.

The explanation is as follows: The sediment in the water was produced by the breaking and fracturing of the clay bank, which fracturing so loosened the clay that it could be carried away in suspension. This continued until a large quantity of clay had been removed from a stratum immediately underlying the surface sod. The most evident explanation for the slipping of the clay and its uptilting in the stream bed is that a stratum of blue clay rested on an inclined plane which was rendered slippery by the water of the spring. This stratum was separated from the surface sod by the washing away of the clay between them. When it slipped it was stopped either by the former rock bank of the stream or by some other obstacle, the slope and weight being sufficient to push the clay up from the stream bed and to raise with it the pier and part of the dam.

After the last slipping the muddiness of the water was greatly lessened showing that the movement of the ground had almost ceased. Since then, however, the amount of sediment in the water has increased, indicating that a further fracturing is in progress.

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